

**United States Department of Energy  
Clean Cities International  
India Trip Report  
LPG Autogas Delegation**



**December 9 – December 17, 2002**

**Ira H. Dorfman  
eMobility International, LLC  
Washington, DC**

## General Overview

The LPG Autogas Delegation, comprised of United States manufacturing representatives with extensive international experience in liquefied petroleum gas (LPG) autogas issues, participated in a nine-day, seven-city tour of major Indian cities from December 9 – 17, 2002. The purpose of the trip was to discuss with key stakeholders the expanded use in India of LPG as a domestic auto fuel. The trip was sponsored by the US Department of Energy's International Clean Cities Program. The trip itinerary and Delegation meetings were arranged and coordinated by the United States/Asian Environmental Partnership (USAEP).

Clean Cities International, modeled after the U.S. Department of Energy's (DOE) domestic Clean Cities Program, aims to replicate the successful U.S. program in cities internationally. The environmental benefits of using alternative fuels are clear. All nations can profit from cleaning their air, producing their fuels domestically, and enhancing local economic activity. Clean Cities International is successfully using its experience in more than eighty North American cities to help international communities realize the benefits of alternative fuel vehicles (AFVs). Clean Cities International works with foreign governments, organizations, and individuals to help establish foundations for viable alternative fuel markets in their major cities.

The United States-Asia Environmental Partnership (US-AEP) is a public-private initiative that promotes environmentally sustainable development in Asia. US-AEP is jointly implemented by several U.S. government agencies, under the leadership of the U.S. Agency for International Development (USAID).

US-AEP's mission is to promote a "clean revolution" in Asia. Just as the "green revolution" of the 1970s and 80s completely changed Asia's approach to agriculture and how to feed its peoples, Asia today could be on the cusp of a "clean revolution"—transforming how Asia industrializes and protects its environment. "Clean revolution" includes the continuing development and adoption of ever less-polluting and more resource-efficient products, processes and services, including transportation.

Objectives of the trip included assessments of business opportunities for US-based manufacturers to participate in the development of LPG-related projects in India; and utilization of the extensive international expertise of the Delegation to evaluate the issues of training, certification, codes and standards, marketing, product development and safety of an emerging Indian LPG autogas industry.

The touring Delegation was comprised of K. Balakrishnan, USAEP-New Delhi; Ira H. Dorfman, eMobility International, Washington, DC, representing the US Department of Energy's International Clean Cities program; Robin Parsons, Clean Fueling Technologies, Georgetown, TX; Suyash Gupta, Shailesh Gupta and H.S. Gupta, HT Process Controls Ltd., Faridabad, Haryana, India, the in-country representatives of Clean Fueling

Technologies; William J. Kolb, Liquid Controls, Lake Bluff, IL; Harshad Chhaya, Liquid Controls India, Mumbai, India; Gagan Agrawal and Shishir Agrawal, Minda IMPCO, Gurgaon, Haryana, India, an Indo-American Joint Venture with IMPCO Technologies, Cerritos, CA; and S.M. Kelkar, OPW India, a joint venture with OPW, Hamilton, OH.

Delegation meetings included discussions with all of India's major oil companies; leading domestic manufacturers of transit buses, automobiles and three-wheelers; Indian government agencies responsible for environmental policy, enforcement and certification and transportation policy; transit agencies; conversion kit manufacturers; and preeminent trade and research organizations. The Delegation tour included visits to seven Indian cities including New Delhi, Mumbai, Pune, Hyderabad, Bangalore, Chennai and Kolkata. A complete trip itinerary is included as *Addendum A*.

All of the cities visited face major challenges to improve ambient air quality standards. According to the World Health Organization, for example, New Delhi is one of the ten most polluted cities in the world. Surveys indicate that in New Delhi the incidence of respiratory diseases due to air pollution is about twelve times the national average. Of the three million premature deaths in the world that occur each year due to air pollution, the highest number occur in India.

A study conducted in Kolkata by India's National Environmental Engineering Research Institute estimates that 60% of Kolkata's residents suffer from some kind of respiratory disease due to air pollution. Carbon monoxide and NO<sub>x</sub>, emissions from motor vehicles are probably the greatest long-term threat to Kolkata's air quality. At the same time, Kolkata's motor vehicle population continues to double every six years.

Urbanization is progressing much faster in developing countries than in developed countries. Motor vehicles are much more common in developed countries. In 1996, there were 559 motor vehicles per 1,000 people in high-income countries compared with just 8 per 1,000 in low-income countries. In India, the ratio is even smaller – 4 motor vehicles per 1,000 – providing 40 million vehicles in a country with a population of 1 billion. But despite the low per capita ownership of motor vehicles in developing countries, these vehicles are still responsible for as much as 70% of the serious air pollution. This results from the vehicles operating in concentrated areas with substandard roads and enormous congestion. To make matters worse, many of the vehicles are in poor mechanical condition. There are few emission standards, and where they exist, they are rarely enforced.

India's high concentration of pollution is not due to a lack of government effort to build a sound environmental legal regime, but rather to a lack of enforcement at the local level. Not only are vehicles responsible for 70% of air emissions in India (untreated industrial smoke is the other major source of air pollution), but also motor vehicles constitute the country's fastest growing emissions source. While India's gross domestic

product has increased 2.5 times over the past twenty years, vehicular pollution has increased eight times.

According to the World Health Organization's air quality standards, the concentration of suspended particulate matter should be less than 90 micrograms per cubic meter. Yet, in a 1995 study, the Indian cities of Mumbai, Kolkata and Delhi reported levels of 240, 375 and 415 respectively. The population (Year 2000 estimates) of Indian cities included in the LPG tour were: Bangalore – 5.6 million; Kolkata – 12.9 million; Chennai – 6 million; New Delhi – 11.7 million; Hyderabad – 6.8 million; Mumbai – 18.1 million; and Pune – 3.5 million. India's overall population of greater than one billion makes it the second most populated country on the planet.

### Key Observations

- More than one million illegal LPG vehicle conversions nationwide have already been quantified. These vehicles, primarily taxis and auto rickshaws, are utilizing low-cost, government-subsidized domestic LPG that is distributed in storage tanks intended exclusively for domestic cooking. These storage tanks are inherently unsafe in transportation applications. Reports of catastrophic failure of these tanks during vehicular accidents have been reported in several jurisdictions. Under no circumstances can such cylinders be utilized safely in transportation applications.
- Motivation for these illegal and unsafe conversions is completely economic – the price of domestic LPG is government subsidized and consequently is much less costly than petrol or other fuels. There is no tangible evidence of air quality improvement that can be linked to the 1,000,000 or more “unauthorized” LPG Autogas installations.
- The potential of catastrophic accidents grows daily in the absence of government of industry policing of the market place.
- Government and industry failed to recognize the risks associated with the use of domestic cylinders for Autogas applications, allowing the unchecked growth of this “underground” industry.
- Fifteen LPG conversion kits have been approved by the Automotive Research Association of India for legal LPG vehicle conversions. It is assumed that such kits will be used with transportation-grade fuel storage cylinders. However, even with the safe installation of such kits, many of these approved kits will still not provide any air quality benefit, not even achieving Euro I emissions standards. Also, kits approved for specific model-year use are reportedly being illegally utilized for conversions of vehicles of other model years.

- State government officials are panicked about LPG autogas certification and enforcement issues since the officials possess little technical understanding of the systems and can not differentiate between good and bad conversions. At the same time, no training or certification programs for LPG kit installers are in place.
- Oil companies are generally reticent to build new LPG stations. While they are resigned to building and operating the stations required by government mandates, they see very little near-term demand for the few stations that are already open and see little evidence that demand will increase any time soon. Many companies candidly admit that their high investment in refinery upgrades to accommodate low-sulfur diesel fuel is at conflict with an LPG autogas economy that can reduce diesel fuel requirements. Before oil companies commit to building larger numbers of LPG stations, they want to see evidence of automakers providing more original-equipment LPG vehicles that will increase LPG autogas demand in the marketplace.
- Lack of decisive action by the major oil companies has left an opportunity for smaller and less experienced companies to move aggressively into the marketplace. However, these companies are often neither well technically supported nor financed, leading to a preponderance in the marketplace of cheap, uncertified and unsafe technology.
- Ironically, while lack of conversion kit and installer standards and certification raise grave safety risks for vehicles operating with domestic LPG cylinders, the Indian government's CCOE has imposed LPG station specifications that are among the most stringent in the world. The regulations based on these standards, much more stringent than the US standards, have created unnecessary obstacles to the growth of the LPG autogas infrastructure. The regulations increase station costs by one-third to one-half, without providing additional safety margins, prohibit the use of above-ground storage systems that are widely used around the world, and prohibit the construction of adjacent fueling station convenience stores on which the oil companies depend for improved profit margins.
- The adoption of stations technical specifications based on a single market's experience, has resulted in a stations standard with a per site cost of more than three times that of other proven technologies.
- The auto companies have plans to introduce soon new LPG model vehicles. The bus manufacturers are also very interested in manufacturing more LPG models since their customers understand that inter-city routes, and in areas inaccessible to CNG infrastructure, LPG makes sense as a bus fuel. Transit agencies are very interested in LPG bus demonstration projects but require convenient fueling sites to assure that the programs are viable.

- Assumptions based on CNG experience are accepted as fact, such as the misperception that heavy duty engines cannot utilize LPG.

#### Specific Opportunities Identified/Requests for Assistance Received

- Bangalore Transportation Secretary Sridhar requested enforcement and certification training; he is also interested participating in an LPG bus demonstration project;
- Hyderabad Municipal Administration and Urban Development Secretary Chatterjee is strongly interested in the expansion of the LPG autogas infrastructure to include LPG-powered irrigation pumping and power generation in agricultural areas;
- Hyderabad Municipal Corporation Commissioner Reddy proposes to integrate an LPG bus demonstration project directly into the city's new modern commuter rail service that was scheduled to open in March 2003;
- Ashok Leyland's R. Devarajan expressed willingness to both move ahead with LPG engine integration in its buses and support demonstration project activities;
- State Government of Tamil Nadu (Chennai) Transport Secretary Karpooora Sundara Pandiyan offered to utilize two of ten buses to be delivered shortly to its transit agency for an LPG bus demonstration project;
- Hindustan Motors is willing to provide two LPG Ambassador model taxis for a demonstration project. It also requested help in developing an LPG engine from its 5.5 Liter diesel block that can support medium and heavy duty truck and bus applications;
- USAID proposes to incorporate LPG vehicles into the electric vehicle demonstration program at the Taj Mahal in Agra.

#### Items Requiring Near-term Action

- Safety of OEM and after-market LPG systems are of great concern to government officials responsible both for developing and enforcing regulations. Training is especially important for enforcement agencies that have difficulty differentiating between safe and unsafe installations. Additionally, kit installers must be trained and certified to assure that installations are safe and provide air quality benefits. A technician training program is also urgently needed. The technician training program is envisioned that is modeled after a successful program in Mexico providing hands-on training of individuals who demonstrate mechanical proficiency but are challenged by literacy issues;

- Planning, coordinator and implementation of the vehicle demonstration programs referenced in the “opportunities” section above;
- A Reverse Trade Mission that provides an opportunity for Indian regulators to assess appropriate standards for based on the operational record of the equipment in a variety of international applications;
- The creation of the Indian LPG Autogas Coalition (ILPGAC), comprised of organizations such as the Oil Industry & Petroleum Ministry; Union Ministry of Surface Transport; SIAM; All State Transport Authority & Transport Ministries; State Roadways Authorities; Taxi & three-wheeler unions; CCOE; ARAI; State Pollution Control Boards/Central Pollution Control Board; CIRT; Infrastructure providers such as station installers, dispensing pump manufacturers, pump and metering system manufacturers and other component suppliers; conversion kit suppliers; and American government and industry representatives to assure a well coordinated and self-policed LPG program.

#### The Indian LPG Autogas Coalition (ILPGAC)

The Delegation proposes to create a strong coalition of interested stakeholders that can develop the foundation for success in the use and promotion of LPG Autogas in India. The stated program goals of the Coalition include:

- Development of methods for quantifying emission mitigation;
- A catalyst for developing strategic relationships among industry stakeholders;
- Utility of recognized world standards for safety, training and technology;
- A cohesive and balanced growth strategy for the industry that ensures sustainability and beneficial results;
- Integration into its LPG transportation infrastructure planning process of assessments for the coordinated use of LPG in power generation and irrigation.

#### Specific Objectives of the ILPGAC

- Develop a training program for three levels of proficiency -- beginner, intermediate and advanced -- and maintain and update the program to address changing circumstances and emerging technologies and standards;

- Adapt technical standards that are proven and recognized as safe and preferable throughout the world;
- Eliminate or minimize the use of unsafe and low quality systems and practices that can result in personal injury or negative environmental performance
- Eliminate the misguided selection of low-cost equipment without sufficient consideration to quality, performance degradation over time, service, support and durability;
- Assist with the development and implementation of effective public education and promotion programs, highlighting the economic, environmental, safety and health benefits of proper LPG use;
- Develop and administer an effective program of industry-policed certification of vehicle systems, installation shops and technicians, in cooperation with government agencies including CCOE, Regional PCB's, ARIA and others;
- Implement and administer a membership dues program that is structured to minimize consumer impact, but to provide sufficient revenue for meeting the budgetary requirements of Coalition programs and administration.

#### Proposed Program Areas of ILPGAC

##### **Executive Leadership**

- Review, Approve and Monitor Projects & Grants
- Industry Liaison
- General Oversight, Leadership & Management

##### **Administrative**

- Accounting & Revenue Collection
- Training / Program Planning & Management
- Materials Distribution
- Ordering & Inventory

##### **Training Programs**

###### Beginner

- Introduction to LPG
- Qualification of Vehicle Candidates
- Basic System Installation

- Safety and Handling

#### Intermediate

- Identify Proper Systems
- Repair and Maintenance
- Calibration & Set-up of Kit
- Understanding Emissions

#### Advanced

- Diagnostic and Troubleshooting
- Emissions Testing

### **Public Awareness Programs**

- Television, Radio and Print Media
- Seminars and Demonstrations
- Ads on buses and taxis
- Cooperative Agreements
- Public Policy Incentives

### **Technical Standards Committee**

- Closed Loop Emission Control Systems
- Tank Safety and Applications
- Station Requirements

### Funding Sources for ILPGAC

#### **Membership Dues Structure**

Fuel Marketers	\$7,500/year
Vehicle Manufacturers	\$5,000/year
Equipment Manufacturers	\$2,500/year
NGOs	\$ 500/year
Government Entities	\$ 500/year

#### **Residual Equipment / Shop Income**

Vehicle Kits	\$ .50 each
Vehicle Tanks	\$ .50 each
Shop Certification	\$ 100/year

### First-Year Funding Forecast for ILPGAC

### **2003-2004 Revenue**

Fuel Marketers	(10)	\$ 75,000
Vehicle Manu.	(5)	\$ 25,000
Equipment Manufacturers	(30)	\$ 75,000
NGO/Government Entities	(15)	\$ 7,500
Vehicle Kits	(200K)	\$100,000
Vehicle Tanks	(200K)	\$100,000
Shop Certification	(200)	<u>\$ 20,000</u>

Total Annual Revenue                      \$402,500

Costs Guideline for ILPGAC Organization

Administrative Costs	25%
Training Costs/Programs	40%
Projects and Grants	35%

## Schedule of Meetings

### Details of Individual Meetings Conducted

Monday, December 09, 2002  
New Delhi

#### Meeting with US Agency for International Development American Embassy, New Delhi

##### Participants:

John Smith-Sreen, Deputy Director, Office of Environment, Energy & Enterprise  
Ram Berry, Program Manager, Office of Environment, Energy & Enterprise  
Discussion began with a review of the LPG autogas delegation mission and the introduction of all delegates, and the roles of their respective companies.

Monday, December 09, 2002  
New Delhi

#### Meeting with Northern Region Coordinator, Oil Industry

##### Participants:

V. K. Chaudhri, Executive Director, Northern Region–Indian Oil Corporation; also  
Regional Coordinator, Oil Industry  
B.B. Choudhary, DGM, Northern Region Marketing Division, Indian Oil Corporation

#### Meeting with Society of India Automobiles Manufacturers (SIAM)

##### Participants:

K.K. Gandhi, Senior Advisor  
Rajat Nandi, Director General  
Deepti Singh, Executive Officer

#### Meeting with Chairman, Delhi Transport Corporation

##### Participants:

Mr. A.J. Sahney

Tuesday, December 10, 2002  
Mumbai, India

Meeting with Office of the Transport Commissioner, Maharashtra State, Mumbai

Participants:

Transport Commissioner B.I. Nagarale

Satish B. Sahasrabudhe, Deputy Commissioner of Transport

Meeting with Indian Oil Corporation, Marketing Division

Participants:

V.C. Sikka, General Manager I/C (LPG)

Sunil Mathur

Meeting with Bharat Petroleum Corporation Limited

Participants:

R.K. Singh, Executive Director (LPG)

N. Dasgupta, Chief Manager HSE (LPG)

K.S. Shankaran, Chief Strategic Planning Manager (LPG)

Meeting with Hindustan Petroleum Corporation Limited.

Participants:

S.V. Sahni, General Manager LPG (SBU)

P.S. Murthy, Manager – LPG Projects

Wednesday, December 11

Meeting with Essar Oil Limited, Marketing Division

Participants:

Raj K. Verma, Chief Executive (Marketing Division)

G.P. Arvind, General Manager (Marketing Division)

A.V. Vairagkar, Jt.General Manager (Marketing Division)

H.B. Kalavar, Consultant (Marketing Division)

Meeting with Reliance Petroleum Limited

Participants:

J. John, Vice President, LPG Marketing Division

V. Venkatapathy, General Manager (Marketing)

Bidyut Dutta, Deputy General Manager

Wednesday, 11 December:            Travel by car to Pune

Thursday, 12 December

Breakfast Meeting with Bajaj Auto Limited

Participants:

N.V. Iyer, General Manager (Engineering Support)

Ashok Saxena, Deputy General Manager (Product Engineering)

Meeting with Automotive Research Association of India (ARAI)

Participants:

Balraj Bhanot, Director

M.K. Chaudhari, Senior Deputy Director

Meeting with Central Institute of Road Transport (CIRT)

Participants:

D.P. Saste, Coordinator –Customer Service & Scientist – Electrical Laboratory

Thursday, 12 December: Travel to Bangalore

Thursday, 12 December

Conference chaired by Bangalore Transport Secretary

Participants:

Mr. Sridhar, Transport Secretary

T. Thimmegowda, Transport Commissioner

C.R. Mohammed Suleman, Joint Commissioner for Transport

Uendra Tripathi, Chairman, Karnataka Pollution Control Board

Ms. Latha Krishna Rao, Secretary (Ecology & Environment)

Ms. Shoba Nambisan, Commissioner-Food & Civil Services Department

Meeting with Karnataka Pollution Control Board

Participants:

Ms. Latha Krishna

Meeting with Sri LPG - Mysore

Participants:

Mr. Sanjay, the president and his chief engineer

Friday 13 December: Travel to Hyderabad

Meeting with Joint Transport Commissioner, Regional Transport Authority, Government of Andhra Pradesh

Participants:

Mr. C L N Gandhi, Joint Transport Commissioner

Meeting with Municipal Administration and Urban Development, Government of Andhra Pradesh

Participants:

Mr. T. Chatterjee, Principal Secretary to Government & Commissioner Urban Poverty Alleviation

Meeting with Andhra Pradesh Pollution Control Board

Participants:

Dr. (Mrs). K. V. Ramani, Joint Chief Environmental Scientist

Meeting with Municipal Corporation of Hyderabad

Participants:

P. Ranadhir Reddy, Additional Commissioner & Project Director (MRTS)

Meeting with Shri Shakthi LPG Ltd.

Participants:

D.V Manohar - Chairman and Managing Director

D.V. Sathya Kumar - Director

J.P. Ramappa - Vice President -Marketing

Ch. Chalapathi Rao- Chief Manager

P.S. Narayana, Vice President & Company Secretary

J. Durga Prasad Rao, Chief Manager - Marketing

Saturday, 14 December: Travel to Chennai

Conference chaired by Transport Commissioner Mr. N.S. Palanippan.

Meeting with Government of Tamil Nadu

Participants:

Transport Secretary, Mr. Karpoora Sundara Pandiyan

Meeting with Caltex Gas India Private Ltd.

Participants:

Rajen Adarkar, Country Chairman  
N.V. Mohan, General Manager  
R. Anandan, Manager (Imports & Bulk Sales)

Meeting with IC Fuels – Trivandrum

Participants:

Mr. Balu

Meeting with Ashok Leyland

Participants:

R. Devarajan, Special Director (Product Development)

Sunday, 15 December: Travel to Calcutta

Monday, 16 December:

Meeting with Hindustan Motors Limited

Participants:

Dipak Munshi, Factory Manager  
Patnala Ramarao Achari, General Manager – Mechanical  
Dr. Biplab K. Dutta, General Manager – Systems & Management Services  
Syed Abdul Nafis, Deputy General Manager – R&D Centre  
Shankar Rao, General Manager – TQM, Quality Assurance & Product Service

Meeting with West Bengal Pollution Control Board

Participants:

Mr. Prashant, Director and Jt. Secy., Public Vehicles Directories  
Hirak Ghosh, Principal Secretary  
Ravi Kant, Member  
Sultan Singh, Addl. Director General & Inspector General of Police  
Dr. Tapas Kr. Gupta, Senior Environmental Engineer

Monday, 16 December: Travel to Delhi

Tuesday, 17 December:

Debriefing at American Embassy

Participants:

Kristen Easter, Country Director  
Lori Peterson Dando  
Ram Berry  
K. Balakrishnan  
John Smith-Sreen

***Final Schedule***  
***LPG Delegation, Dec 09-Dec. 17, 2002***

December 7/8: Delegation arrives in New Delhi

Stay at:  
Taj Palace  
Sardar Patel Marg  
New Delhi 110021  
Tel: 91-11- 2611 0202

Monday, December 09: Meeting with USAEP/New Delhi  
Time: 8:30 AM  
Venue: USAEP Office, EG Conference  
American Embassy, Chanakyapuri,  
New Delhi

Monday, December 09: Meeting with V. K. Chowdhary, Executive Director – Northern  
Region,  
Region Co-ordinator, Oil Industry  
Time: 10:00 AM  
Venue:  
Indian Oil Corporation Limited  
(Marketing Division) Northern Region  
'Indian Oil Bhavan'  
1, Sri Aurobindo Murg,  
Yusuf Sarai,  
New Delhi – 110 016  
Tel: 26521891, 26518080 (EPABX)

Monday, December 09: Meeting with Society of India Automobiles Manufacturers.  
Time: 12:00 PM  
Venue: Office of SIAM  
India Habitat Center  
Lodhi Road  
New Delhi 110003

Monday, December 09: Lunch (Hosted by SIAM)  
Time: 1:00 PM

Monday, December 09: Meeting with Ajay Maken, Transport Minister, Government of National capital Territory of Delhi  
Time: 2:00 PM  
Venue: New Secretariat, 8<sup>th</sup> Floor, Office of the Minister Transport, Tourism and Power

Monday, December 09: Meeting with Mr. Savitur Prasad, Financial Advisor and Chief General Manager, Delhi Transport Corporation  
Time: 3:30 PM  
Venue: DTC Headquarter, 1<sup>st</sup> Floor, I.P. Estate, New Delhi 11 0 002

Monday, December 09: Travel to Mumbai  
Flight: 9W 312  
Departure Time: 2030  
Arrival Time: 2225

Check into Hotel Orchid  
70-C Nehru Road Adjacent to Domestic Airport  
Vile Parle (East) Mumbai - 400 099  
Tel : (91 22) 2616 4040

Tuesday, December 10: Meeting with Mr. B. Nagarale, Transport Commissioner and Mr. Sahassrabudhe, Dy Transport Commissioner  
Time: 10:45 AM  
Venue: New Administrative Building  
4<sup>th</sup> Floor, Near Dr. Ambedkar Garden  
Government Colony  
Bandra (E), Mumbai 400 051  
Tel: 91-22- 2651 6336/2641 4899 (Contact Mrs. Savant)

Tuesday, December 10: Meeting with Mr. V.C. Sikka, Executive Director (LPG), and Sunil Mathur, General Manager, Indian Oil Corporation, Marketing Division  
Time: 12:00 PM  
Venue: G-9, Ali Yavar Jung Marg  
Bandra (E)  
Mumbai 400 051  
Tel: 91-22-2642 3272

Tuesday, December 10: Lunch

Time: 1:30 PM

- Tuesday, December 10: Meeting with Mr. R.K. Singh, Executive Director (LPG), and Mr. A.N. Dasgupta, Chief Manager (LPG) Bharat Petroleum Corporation Limited  
Time: 3:00 PM  
Venue: Bharat Bhavan,  
4&6 Currimbhoy Road, Ballard Estate  
Mumbai: 400 001  
Tel: 91-22- 2271 3810
- Tuesday, December 10: Meeting with Mr. S.V. Sahni, General Manager (LPG), Hindustan Petroleum Corporation Ltd.  
Time: 5:00 PM  
Venue: 8, Shoorji Vallabhdas Marg  
Mumbai- 400 001  
Tel: 022-2261 8031
- Tuesday, December 10: RON
- Wednesday, December 11: Meeting with Mr. Raj K. Verma, Chief Executive (Marketing Division), and Mr. G.P. Arvind, General Manager (Marketing), Essar Oil Limited  
*Time: 11:30 AM*  
*Venue: Essar House, PO Box 945*  
*Mahalaxmi, Mumbai -400 034*  
*Tel: 91-22-2460 1157*
- Wednesday, 11 December: Lunch  
1:30 PM
- Wednesday, 11 December: Meeting with Mr. J. John, Vice President, LPG Marketing Division, Reliance Petroleum Limited  
Time: 2:00 PM  
Venue: Dhirubhai Ambani Knowledge City  
"C" Block, "B" Wing, 2nd Floor  
Opp. Koparkhairne Rly. Stn.  
Thane - Belapur Road  
Navi Mumbai 400 709  
Tel: 022-27625462
- Wednesday, 11 December: Depart for Pune by Road  
Time: 5:00 PM

Wednesday, 11 December: Reach Pune  
Time: 8:00 PM.  
Check into the Hotel  
Hotel Le Meridien  
R.B.M Road,  
Pune 411001.  
**Tel : - +91 20 26050505**

Wednesday, 11 December: Meeting over dinner with Mr. Director,  
Automotive Research Association of India  
Time: 8:30 PM  
***Venue: Le Meridien***  
***Cell no. for Mr. Bhanot: 9810094896***

Thursday, 12 December: Breakfast Meeting with Mr. N.V. Iyer, General Manager  
(Engg Support), Bajaj Auto Limited.  
Time: 8:00 AM  
Venue: Le Meridien Coffee Shop  
***Cell No for Mr. Iyer: 9822395180***

Thursday, 12 December: Meeting with Mr. A. S. Lakra, Director, Central Institute of  
Road Transport and Mr. S. K. Vikram, General Manager,  
Tata Engineering (Tel: 020 740 2977, Mobile:9822171509)  
Time: 10:30 AM  
Venue: Bhosari, Pune -411026  
Tel: 020-27125177, 27125292

Thursday, 12 December: Depart for Bangalore  
Flight: 9W 446  
Time: 2:00 PM

Thursday, 12 December: Reach Bangalore  
Time: 3:30 PM  
Check into the Hotel  
Taj Residency  
41/3, Mahatma Gandhi Road, Bangalore 560 001  
Tel: 91-80-2558 4444

Friday, 12 December: Conference chaired by Transport Secretary, Mr. Sridhar.  
Other Participants: Mr. Thimmegowda, Transport  
Commissioner; Mr. Upendra Tripathi, Chairman,  
Karnataka Pollution Control Board, Ms. Latha Krishna  
Rao, Secretary (Ecology & Environment); Ms. Shoba  
Nambisan, Commissioner-Food & Civil Services Dept.

Time: 4:30 PM  
Venue: Committee Room  
# 262, Gate No. 2, Multistoried Building  
Bangalore  
Tel. No. for Mr. Sridhar: 080-2220 5446

Thursday, 12 December: Meeting with Mr. Sanjay, Sri LPG - Mysore  
Time: 6:30 PM  
Venue: At Hotel Taj Residency, Bangalore

Friday 13 December: Flight to Hyderabad  
Flight: IC 962  
Time: 6:25 AM

Friday, 13 December Reach Hyderabad  
Time: 7:25 AM  
Check into Hotel  
Taj Residency  
Road No 1  
Banjara Hills, Hyderabad 500 034  
Tel: 91-40-2339 9999

Friday, 13 December: Meeting with Mr. C L N Gandhi, Joint Transport  
Commissioner, Regional Transport Authority, Government  
of Andhra Pradesh  
Time: 10:00 AM  
Venue: Somajiguda, Khairtabad, Hyderabad- 500082  
Tel: 040-2331 1269

Friday, 13 December Meeting with Mr. Tishya Chatterjee, Principal Secretary,  
Municipal Administration and Urban Development  
Time: 12:00 PM  
Venue: Secretariat, Hyderabad  
Tel: 040-2345 4965

Friday, 13 December Lunch  
1:30 PM

Friday, 13 December Meeting with Mrs. K. V. Ramani, Jt. Chief Env. Scientist,  
Andhra Pradesh Pollution Control Board  
Time: 3:00 PM  
Venue: APCB, Maltrivanam, HUDA Complex  
2<sup>nd</sup> Floor, SR Nagar, Hyderabad- 500038  
Tel: 040-23752728

Friday, 13 December	<p>Meeting with Ms. Chitra Ramachandran IAS Commissioner - Municipal Corporation, A.P. Tel: 2322 5267, Fax: 2322 0430 <b>&amp;</b> Mr. Ranadhit Reddy IAS, Additional Commissioner - Tel: 2322 0848, Fax: 2322 4824 Mob: 98490 04506 Venue: Municipal Complex, Tankbund Road, Hyderabad - 500 063. Time: 4:30 PM</p>
Friday, 13 December	<p>Meeting with Executives of Shri Shakthi Alternative Energy Ltd.</p> <p><b><u>Participants</u></b> Mr. D.V Manohar - Chairman and Managing Director Mr. DV Sathya Kumar - Executive Director Mr. J.P. Ramappa - Vice President -Marketing Mr. Ch. Chalapathi Roa - Chief Manager. Time: 6:30 PM Venue: 1<sup>st</sup> Floor, Venus Plaza, Begumpet, Hyderabad - 500 016.</p>
Saturday, 14 December:	<p>Flight to Chennai Flight: IC 952 Time: 6:30 AM</p>
Saturday, 14 December:	<p>Reach Chennai Time: 7:30 AM Check into Hotel Le Meridien</p>
Saturday, 14 December:	<p>Conference chaired by Transport Commissioner Mr. N.S. Palanippan. Expected number of participants: <b>25</b> Time: 11:00 AM Venue: Ezilagam, Chepauk, Chennai 600 005 Chennai- 600 005 Tel: 044 2852 0682</p>
Saturday, 14 December	<p>Lunch</p>

1:30 PM

Saturday, 14 December:	Meeting with, Transport Secretary, Mr. Karpoor Sundara Pandiyan, Govt. of Tamil Nadu Time: 3:30 PM Venue: To be decided
Saturday, 14 December	Meeting with Mr. Rajan V. Adarkar, Chief Executive Officer, Caltex SPIC India Ltd. Time: 4:30 Pm Venue: AT Hotel Le Meridian, Chennai
Sunday, 15 December:	Meeting with Mr. Balu - IC fuels – Trivandrum Time: 10:00 AM Venue: At Hotel Le Meridian - Chennai.
Sunday, 15 December:	Flight to Kolkata Flight: 9W841 Time: 5:00 PM
Sunday, 15 December:	Reach Kolkata Time: 7:05 PM Check into hotel Taj Bengal 34 B Belvedere Road, Alipore Kolkata Tel: 91-33- 223 3939
Monday, 16 December:	Meeting with Mr. Deepak Munshi, Factory Manager, Hindustan Motors Time: 12:00 PM Venue: Hind Motor 712 233, Dist. Hoogly, West Bengal Tel: 033-2664 7177
Monday, 16 December	Meeting with Mr. Prashant, Director and Jt. Secy., Public Vehicles Directories & Mr. Hirak Ghosh, Principal Secretary, Department of Environment, and Mr. Ravi Kant, Member Secretary, West Bengal Pollution Control Board Time: 3:00 PM Venue: Paribesh Bhawan 10 A, Block LA Sector III, Salt Lake City Kolkata 700098

Tel: 91-33- 23358213

Monday, 16 December: Flight to Delhi  
Flight: 9W 912  
Time: 8:10 PM

Monday, 16 December: Reach Delhi  
Time: 10:15 PM  
Check into Hotel Taj Palace  
Sardar Patel Marg  
New Delhi 110021  
Tel: 91-11- 2611 0202

Tuesday, 17 December: Debriefing  
Time: 8:30 AM  
Venue: USAEP Office

Tuesday, 17 December: Depart for US